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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,717	10/19/2001	Kireeti Kompella	1014-013US01	9695

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EXAMINER	
SHAW, PELING ANDY	

ART UNIT	PAPER NUMBER
2144	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/045,717	KOMPELLA, KIREETI	
	Examiner	Art Unit	
	Peling A. Shaw	2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37 and 39-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37 and 39-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

PAS

DETAILED ACTION

Continued Examination under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/24/2006 has been entered.

2. Claims 1-3, 5-7, 9, 12-13, 17, 22-25, 28-30, 32-37, 39-41 and 43 are amended. Claim 38 is cancelled. Claims 1-37 and 39-44 are currently pending.

3. Amendment received on 11/23/2005 was entered. Claim 12 was amended.

Priority

4. This application has no priority claim made. The filing date is 10/19/2001.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Aramaki et al. (US 6618760 B1), hereinafter referred as Aramaki.

a. Regarding claim 1, Aramaki disclosed a method comprising: storing, within a network router, a forwarding tree having a set of nodes, wherein nodes include leaf nodes that correspond to destinations within a computer network (column 2, line 5-column 3, lines 43: binary tree, radix tree; column 5, line 41-column 6, line 3: hop pointers indicating next forwarding destination stored in second table; first table have only second table pointers as entries); storing, external to the forwarding tree, next hop data representing network devices neighboring the network router (column 1, lines 21-26: output interface or an IP address of a router as the next transit destination); storing, within the leaf nodes of the forwarding tree, indirect next hop data that maps the leaf nodes of the forwarding tree to the next hop data, wherein at least two different ones of the leaf nodes of the forwarding tree contain indirect next hop data that references the next hop data for the same neighboring network device (column 5, line 41-column 6, line 3: hop pointers indicating next forwarding destination stored in second table); identifying a key within a network packet (column 1, lines 27-31: IP address as a retrieval key); traversing a subset of the nodes of the forwarding tree within a network device by testing at least one bit of the key per each of the traversed nodes, wherein values of the tested bits in the key determine a path traversed along the forwarding tree until reaching one of the leaf nodes of the forwarding tree (column 1, line 57-column 3, line 43: binary tree and radix tree retrieval methods); upon reaching a leaf node of the traversed path, using the indirect next hop data within the leaf node of the traversed path to select a next hop form the next hop data external to the forwarding tree (column 6, line 17-column 7, line 10:

retrieve hop pointer), and forwarding the packet to the selected next hop (column 1, lines 14-20: forward an incoming data signal such as an IP packet to a communication network).

b. Regarding claim 2, Aramaki disclosed the method of claim 1, wherein the forwarding tree comprises a radix tree (column 2, line 14-40).

c. Regarding claim 5, Aramaki disclosed the method of claim 2, wherein storing the indirect next hop data comprises storing a data pointer within each of the leaf nodes that references the next hope data external to the forwarding tree (column 5, line 48-column 6, line 16: hop pointer).

d. Regarding claim 6, Aramaki disclosed the method of claim 1, wherein storing the next hop data comprises storing an array of next hop data elements external to the forwarding tree (column 5, line 41-column 6, line 3: hop pointers indicating next forwarding destination stored in second table, thus the next hop data is stored outside the first and second tables).

e. Claims 12-14 and 16 are of the same scope as claims 1-2 and 5-6. These are rejected for the same reason as for claims 1-2 and 5-6.

f. Claims 17-18 and 22-23 are of the same scope as claims 1-2 and 5. These are rejected for the same reason as for claims 1-2 and 5.

g. Claims 28-31 are of the same scope as claims 1-2 and 5-6. These are rejected for the same reason as for claims 1-2 and 5-6.

h. Claims 37 and 40 are of the same scope as claims 1-2. These are rejected for the same reason as for claims 1-2.

Aramaki disclosed all limitations of claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40.

Claims 1-2, 5-6, 12-14, 16-18, 22-23, 28-31, 37 and 40 are rejected under 35 U.S.C. 102(e).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki et al. (US 6618760 B1), hereinafter referred as Aramaki, and further in view of Cain (US 6857026 B1), hereinafter referred as Cain.

a. Aramaki shows claims 1-2 as above. Aramaki does not show (claim 3) storing a primary next hop reference and a backup next hop reference.
b. Cain shows (column 4, line 12-56) specifying a preferred route and alternate route in an analogous art for the purpose of using alternate routes for fail-over in a communication network.
c. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify Aramaki's functions of using radix tree and hop pointer in setting up a routing table for retrieving routes with Cain's functions of using alternate routes for fail-over in a communication network.
d. The modification would have been obvious because one of ordinary skill in the art would have been motivated to have multiple routes per Cains' teaching in setting up

routing table per Aramaki's teaching to enhance the availability with either multiple network interfaces or different next hop devices(column 4, lines 42-55).

e. Regarding claim 4, Cain shows further comprising routing packets to the backup next hop in response to a network event (column 3, line 38-49: node failure; column 4, line 30-41: failure of link).

f. Regarding claim 7, Cain shows further comprising: receiving a packet comprising network update information (column 5, line 51-63: control message for the route maintenance logic to determine the status of various routes); and modifying the next hop data external to the forwarding tree in response to the network update information without modifying the forwarding tree (column 5, line 19-28 and 42-50: determine and update the availability and priority of routes).

g. Regarding claim 8, Cain shows further comprising: storing routing information within a routing engine, wherein the routing information represents routes within a network (column 5, line 9-29: routes for routing protocol messages; column 5, and 42-50: route computation and maintenance logic); and storing the route data, the indirect next hop data and the next hop data within a packet forwarding engine (column 5, line 9-29 and 42-67: route availability and priority).

h. Regarding claim 9, Cain shows further comprising: receiving a packet comprising network topology update information (column 1, line 29-37: link state routing protocol; Fig. 2, item 204: multiple route information; column 4, line 66-column 5, line 8: multiple route, priority, preferred and alternate route information; column 5, line 29-41: route computation logic computes routes for destinations by running

multiple routing protocols and computes routes); updating the routing information within the routing engine (Fig. 2, item 210: install route; column 2, line 7-10: update the availability, priority of routes, compute new routes; column 4, line 66-column 5, line 8: obtain, prioritize and install route; column 5, 19-28 and 42-50: route computation logic computes routes for destinations by running multiple routing protocols and computes routes); and issuing a message from the routing engine to direct the packet forwarding engine to modify the next hop data in response to the network update information (column 3, line 11-20: link state routing protocol; column 5, line 51-63: routing logic receives control messages and forward to maintenance logic).

i. Regarding claim 10, Cain shows wherein storing the routing information includes storing a copy of the route data, the indirect next hop data and the next hop data stored within the packet forwarding engine (column 5, line 9-29 and 42-67: routing table).

j. Regarding claim 11, Cain shows wherein storing the routing information includes storing a copy of the route data, the indirect next hop data and the next hop data stored within the packet forwarding engine, and issuing the message comprises analyzing the copy to identify the next hop for modification (Fig. 2; column 4, line 66-column 5, line 67: computation logic computes routes for destinations by running multiple routing protocols and computes routes).

k. Claims 15 and 19 are of the same scope as claim 3. These are rejected for the same reasons as for claim 3.

l. Regarding claim 20, Cain shows wherein some of the next hop data represents software modules for processing data packets (column 6, lin1 1-18).

m. Regarding claim 21, Cain shows wherein each of the software modules is selected from one of a packet filter, a policy enforcer and a packet counter (column 4, line 12-29).

n. Claims 24-27 are of the same scope as claims 1, 8-9 and 11. These are rejected for the same reasons as for claims 1, 8-9 and 11.

o. Claims 32-36 are of the same scope as claims 1, 7-9 and 11. These are rejected for the same reasons as for claims 1, 7-9 and 11.

p. Claims 39 and 41-44 are of the same scope as claims 1, 3, 5 and 7-8. These are rejected for the same reasons as for claims 1, 3, 5 and 7-8.

Together Aramaki and Cain disclosed all limitations of claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44. Claims 3-4, 7-11, 15, 19-21, 24-27, 32-36, 39 and 41-44 are rejected under 35 U.S.C. 103(a).

Response to Arguments

7. Applicant's arguments filed on 04/24/2006 with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection.

a. Applicant has made substantial claim language changes, e.g. independent claims 1, 12, 17, 24, 28 and 37. The amended changes explicitly direct the claimed invention toward a routing tree for retrieving routing information in hop pointer. The 102 rejections as laid out in the previous office action are no longer applicable. After a careful re-examination of the amended claim language, the current office action has modified the 102 and 103 rejections based on the prior arts recited in the previous office action.

b. As the amended arguments are based on the previous amended claim language and the rejections in the previous office action, they are no longer applicable to the current amended claim language and thus the rejections in the current office action.

c. Applicant is encouraged to review the current office action and ask for a telephone interview in clarifying the current claim language and/or the current office action.

Remarks

8. The following pertaining arts are discovered and not used in this office action. Office reserves the right to use these arts in later actions.

a. Medard et al. (US 6047331 A) Method and apparatus for automatic protection switching

b. Hariguchi et al. (US 6665297 B1) Network routing table

c. Marques et al. (US 6643706 B1) Scaleable route redistribution mechanism

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to the enclosed PTO-892 for details.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peling A. Shaw whose telephone number is (571) 272-7968. The examiner can normally be reached on M-F 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William C. Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the statu9s of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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